



**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1.-13. (Cancelled)

14. (Currently Amended) An optical disk medium, ~~according to claim~~  
~~13, comprising:~~

a substrate having a structure of an uneven-like shape on a flat surface;

a first reflecting film formed on the substrate and having a surface contoured  
to the uneven-like shape of the substrate, for reflecting a light having a  
predetermined wavelength;

a resin layer having an uneven-like shape on a flat surface directly formed on  
the first reflecting film; and

a second reflecting film formed on the resin layer and having a surface  
ontoured to the uneven-like shape of the resin layer, for reflecting a light having a  
predetermined wavelength.

wherein the uneven-like shapes of the first and second reflecting films  
represent information, respectively, and

wherein a construction arrangement of the optical disk medium satisfies an  
expression of,

$$\lambda/4 \geq | (1/8 NB) \cdot \{(1/NB^2) - 1\} NAF^4 \cdot \Delta d |$$

where  $\lambda$  is a wavelength of the light irradiated on the optical disk for reproducing information; NB is a refractive index of the substrate; NAF is a numerical aperture of the optical system for converging the light; and  $\Delta d$  is a displacement of optical axes of the first and second reflecting films from a predetermined reference surface.

15. (Currently Amended) An optical disk medium, ~~according to claim~~  
~~43, comprising:~~

a substrate having a structure of an uneven-like shape on a flat surface;

a first reflecting film formed on the substrate and having a surface contoured to the uneven-like shape of the substrate, for reflecting a light having a predetermined wavelength;

a resin layer having an uneven-like shape on a flat surface directly formed on the first reflecting film; and

a second reflecting film formed on the resin layer and having a surface contoured to the uneven-like shape of the resin layer, for reflecting a light having a predetermined wavelength.

wherein the uneven-like shapes of the first and second reflecting films represent information, respectively, and

wherein the first and second reflecting films lie in a range from a predetermined plane where a spherical aberration becomes substantially zero, to  $\pm 50 \mu\text{m}$  in a direction perpendicular to the substrate.

16. (Currently Amended) An optical disk medium, according to claim  
~~13~~, comprising:

a substrate having a structure of an uneven-like shape on a flat surface;

a first reflecting film formed on the substrate and having a surface contoured  
to the uneven-like shape of the substrate, for reflecting a light having a  
predetermined wavelength;

a resin layer having an uneven-like shape on a flat surface directly formed on  
the first reflecting film; and

a second reflecting film formed on the resin layer and having a surface  
ontoured to the uneven-like shape of the resin layer, for reflecting a light having a  
predetermined wavelength.

wherein the uneven-like shapes of the first and second reflecting films  
represent information, respectively, and

wherein a distance  $d$  between the first and second films satisfies an  
expression of,

$$b_{MAX} \leq d \times NAF$$

where  $b_{MAX}$  is a pitch of a coarsest pattern of an information mark recorded on the  
optical disk medium; and  $NAF$  is a numerical aperture of an optical system for  
converging the light, and

wherein a radius of a light spot for a reflecting film adjacent to a reflecting film  
being reproduced is formed of a size larger than a pitch of the coarsest pattern of  
the information mark recorded on the optical disk medium.

17. (Currently Amended) An optical disk medium, ~~according to claim~~  
~~13, comprising:~~

a substrate having a structure of an uneven-like shape on a flat surface;

a first reflecting film formed on the substrate and having a surface contoured  
to the uneven-like shape of the substrate, for reflecting a light having a  
predetermined wavelength;

a resin layer having an uneven-like shape on a flat surface directly formed on  
the first reflecting film; and

a second reflecting film formed on the resin layer and having a surface  
ontoured to the uneven-like shape of the resin layer, for reflecting a light having a  
predetermined wavelength.

wherein the uneven-like shapes of the first and second reflecting films  
represent information, respectively, and

wherein in a power spectrum of a modulated signal of information recorded  
on the optical disk medium, a distance  $d$  between the first and second reflecting  
films is determined so that a frequency at which said spectrum starts to abruptly fall  
is set to be higher than a cut-off frequency of an optical property function for an  
adjacent reflecting film.

18. (Currently Amended) An optical disk medium, ~~according to claim~~  
~~13, comprising:~~

a substrate having a structure of an uneven-like shape on a flat surface;

a first reflecting film formed on the substrate and having a surface contoured to the uneven-like shape of the substrate, for reflecting a light having a predetermined wavelength;

a resin layer having an uneven-like shape on a flat surface directly formed on the first reflecting film; and

a second reflecting film formed on the resin layer and having a surface contoured to the uneven-like shape of the resin layer, for reflecting a light having a predetermined wavelength,

wherein the uneven-like shapes of the first and second reflecting films represent information, respectively, and

wherein a construction arrangement of the optical disk medium satisfies an expression of,

$$\lambda/4 \geq | (1/8 NB) \cdot \{(1/NB^2) - 1\} NAF^4 \cdot \Delta d |$$

where  $\lambda$  is a wavelength of the light irradiated on the optical disk for reproducing information; NB is a refractive index of the substrate; NAF is a numerical aperture of the optical system for converging the light; and  $\Delta d$  is a displacement of optical axes of the first and second reflecting films from a predetermined reference surface;

and wherein a distance d between the first and second films satisfies an expression of,

$$bMAX \leq d \times NAF$$

where bMAX is a pitch of a coarsest pattern of an information mark recorded on the optical disk medium; and NAF is a numerical aperture of an optical system for converging the light, in which a radius of a light spot for a reflecting film adjacent to a

reflecting film being reproduced is formed of a size larger than a pitch of the coarsest pattern of the information mark recorded on the optical disk medium.

19. (Currently Amended) An optical disk medium, ~~according to claim~~  
~~43, comprising:~~

a substrate having a structure of an uneven-like shape on a flat surface;

a first reflecting film formed on the substrate and having a surface contoured to the uneven-like shape of the substrate, for reflecting a light having a predetermined wavelength;

a resin layer having an uneven-like shape on a flat surface directly formed on the first reflecting film; and

a second reflecting film formed on the resin layer and having a surface contoured to the uneven-like shape of the resin layer, for reflecting a light having a predetermined wavelength.

wherein the uneven-like shapes of the first and second reflecting films represent information, respectively, and

wherein a construction arrangement of the optical disk medium satisfies an expression of,

$$\lambda/4 \geq | (1/8 NB) \cdot \{(1/NB^2) - 1\} NAF^4 \cdot \Delta d |$$

where  $\lambda$  is a wavelength of the light irradiated on the optical disk for reproducing information; NB is a refractive index of the substrate; NAP is a numerical aperture of the optical system for converging the light and  $\Delta d$  is a displacement of optical axes of the first and second reflecting films from a predetermined reference surface; and

wherein in a power spectra of a modulated signal of information recorded on the optical disk medium, a distance  $d$  between the first and second reflecting films is determined so that a frequency at which said spectra starts to abruptly fall is set to be higher than a cut-off frequency of an optical property function for an adjacent reflecting film.

20. (Currently Amended) An optical disk medium, ~~according to claim~~  
~~43, comprising:~~

a substrate having a structure of an uneven-like shape on a flat surface;

a first reflecting film formed on the substrate and having a surface contoured to the uneven-like shape of the substrate, for reflecting a light having a predetermined wavelength;

a resin layer having an uneven-like shape on a flat surface directly formed on the first reflecting film; and

a second reflecting film formed on the resin layer and having a surface ontoured to the uneven-like shape of the resin layer, for reflecting a light having a predetermined wavelength.

wherein the uneven-like shapes of the first and second reflecting films represent information, respectively, and

wherein the first and second reflecting films lie in a range from a predetermined plane where a spherical aberration becomes substantially zero, to  $\pm 50 \mu\text{m}$  in a direction perpendicular to the substrate; and

wherein a distance  $d$  between the first and second films satisfies an expression of,

$$bMAX \leq d \times NAF$$

where bMAX is a pitch of a coarsest pattern of an information mark recorded on the optical disk medium; and NAF is a numerical aperture of an optical system for converging the light, wherein a radius of a light spot for a reflecting film adjacent to a reflecting film being reproduced is formed of a size larger than a pitch of the coarsest pattern of the information mark recorded on the optical disk medium.

21. (Currently Amended) An optical disk medium, ~~according to claim~~  
~~43, comprising:~~

a substrate having a structure of an uneven-like shape on a flat surface;

a first reflecting film formed on the substrate and having a surface contoured to the uneven-like shape of the substrate, for reflecting a light having a predetermined wavelength;

a resin layer having an uneven-like shape on a flat surface directly formed on the first reflecting film; and

a second reflecting film formed on the resin layer and having a surface contoured to the uneven-like shape of the resin layer, for reflecting a light having a predetermined wavelength,

wherein the uneven-like shapes of the first and second reflecting films represent information, respectively, and

wherein the first and second reflecting films lie in a range from a predetermined plane to  $\pm 50 \mu\text{m}$  in a direction perpendicular to the substrate; and

wherein in a power spectra of a modulated signal of information recorded on the optical disk medium, a distance d between the first and second reflecting films is



determined so that a frequency at which said spectra starts to abruptly fall is set to be higher than a cut-off frequency of an optical property function for an adjacent reflecting film.

22. (Cancelled)

23. (Currently Amended) An optical disk medium, comprising:

a substrate having a structure of an uneven-like shape thereon;

a first film formed on the substrate and having a surface contoured to the uneven-like shape of the substrate:

an intermediate layer formed on the first film and having an uneven-like shape thereon; and

a second film formed on the intermediate layer and having a surface contoured to the uneven-like shape of the intermediate layer,

wherein the optical disk medium is arranged such that a light is irradiated through the substrate by an optical system to detect a reflected light from the first and second films so as to detect the uneven-like shape, and a construction arrangement thereof satisfies an expression of,

$$\lambda/4 \geq | (1/8 NB) \cdot \{(1/NB^2) - 1\} NAF^4 \cdot \Delta d |$$

where  $\lambda$  is a wavelength of the light; NB is a ~~reflective~~refractive index of the substrate; NAF is a numerical aperture of an optical system for converging the light; and  $\Delta d$  is a displacement of optical axes of the first and second films from a predetermined reference surface.

24. (Currently Amended) An optical disk medium, comprising:

- a substrate having a structure of an uneven-like shape thereon;
- a first film formed on the substrate and having a surface contoured to the uneven-like shape of the substrate; and
- an intermediate layer formed on the first film and having an uneven-like shape thereon;
- a second film formed on the intermediate layer and having a surface contoured to the uneven-like shape of the intermediate layer,

wherein the uneven-like shapes of the first and second films represent information, respectively, and

wherein the first and second films lie in a range from a predetermined plane where a spherical aberration becomes substantially zero, to  $\pm 50 \mu\text{m}$  in a direction perpendicular to the substrate.

25. (Original) An optical disk medium according to claim 23, wherein a distance  $d$  between the first and second films satisfies an expression of,

$$b_{\text{MAX}} \leq d \times \text{NAF}$$

where  $b_{\text{MAX}}$  is a pitch of a coarsest pattern of an information mark recorded on the optical disk medium, and NAF is a numerical aperture of an optical system for converging the light; and

wherein a radius of a light spot for a reflecting film adjacent to a reflecting film being reproduced is formed of a size larger than a pitch of the coarsest pattern of the information mark recorded on the optical disk medium.

26. (Original) An optical disk medium according to claim 24, wherein a distance  $d$  between the first and second films satisfies an expression of,

$$b_{MAX} \leq d \times NAF$$

where  $b_{MAX}$  is a pitch of a coarsest pattern of an information mark recorded on the optical disk medium, and  $NAF$  is a numerical aperture of an optical system for converging the light; and

wherein a radius of a light spot for a reflecting film adjacent to a reflecting film being reproduced is formed of a size larger than a pitch of the coarsest pattern of the information mark recorded on the optical disk medium.

27. (Original) An optical disk medium according to claim 23, wherein in a power spectrum of a modulated signal of information recorded on the optical disk medium, a distance  $d$  between the first and second films is determined so that a frequency at which said spectrum starts to abruptly fail is set to be lower than a cut-off frequency of an optical property function for an adjacent reflecting film.

28. (Original) An optical disk medium according to claim 24, wherein in a power spectrum of a modulated signal of information recorded on the optical disk medium, a distance  $d$  between the first and second films is determined so that a frequency at which said spectrum starts to abruptly fall is set to be lower than a cut-off frequency of an optical property function for an adjacent reflecting film.

29. (Currently Amended) An optical information reproducing method, comprising the steps of:

providing an optical disk medium with a substrate having a structure of an uneven-like shape thereon, a first reflecting film formed on the substrate and having a surface contoured to the uneven-like shape of the substrate for reflecting a light having a predetermined wavelength, an intermediate layer formed on the first reflecting film and having an uneven-like shape on a flat surface, and a second reflecting film formed on the intermediate layer and having a surface contoured to the uneven-like shape of the intermediate layer, for reflecting a light having a predetermined wavelength;

irradiating a laser beam on the optical disk medium having said uneven-like shapes representing information on the first and second reflecting films by an optical system;

detecting a laser beam reflected from the first and second reflecting films; and reproducing information from a detected signal,

wherein a construction arrangement of the optical disk medium satisfies an expression of,

$$\lambda/4 \geq \left| \left( \frac{1}{8} NB \right) \cdot \left\{ \left( \frac{1}{NB^2} \right) - 1 \right\} NAF^4 \cdot \Delta d \right|$$

where  $\lambda$  is a wavelength of the light irradiated on the optical disk for reproducing information; NB is a refractive index of the substrate; NAP is a numerical aperture of the optical system for converging the light; and  $\Delta d$  is a displacement of optical axes of the first and second reflecting films from a predetermined reference surface.

30. (Currently Amended) A method according to claim 29, wherein the first and second reflecting films lie in a range from a predetermined plane where a

spherical aberration becomes substantially zero, to  $\pm 50 \mu\text{m}$  in a direction perpendicular to the substrate.

31. (Original) A method according to claim 29, wherein a distance  $d$  between the first and second films satisfies an expression of,

$$b_{\text{MAX}} \leq d \times \text{NAF}$$

where  $b_{\text{MAX}}$  is a pitch of a coarsest pattern of an information mark recorded on the optical disk medium, and  $\text{NAF}$  is a numerical aperture of the optical system for converging the light.

32. (Original) A method according to claim 29, wherein in a power spectrum of a modulated signal of information recorded on the optical disk medium, a distance  $d$  between the first and second reflecting films is determined so that a frequency at which said spectrum starts to abruptly fall is set to be lower than a cut-off frequency of an optical property function for an adjacent reflecting film.

33. (Original) A method according to claim 29, wherein the predetermined reference surface is a plane designed so that the optical system converges the laser beam through the substrate.